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# Substance Abuse and High-Risk Needle-Related Behaviors Among Homeless Youth in Minneapolis: Implications for Prevention

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**ABSTRACT** *Homeless and runaway youth face a variety of health risks, including those related to substance abuse and use of unsterile needles. During 1998–1999, we recruited 201 Minneapolis homeless youths aged 15–22 years; these youths were interviewed by experienced street outreach workers from settings where street youth were known to congregate. Respondents spent a median of 6 months in the previous year living on the streets or "couch hopping." There were 37% who reported having 15 or more alcoholic drinks per week, 41% smoked 1 pack or more of cigarettes per day, and 37% used marijuana 3 or more times a week; 15% reported lifetime injection drug use, including 6% who used injection drugs within the previous month. Twenty percent had received a tattoo, and 18% body piercing with a needle that had not been sterilized or had been used by someone else. There were 68% who had been tested for human immunodeficiency virus (HIV), 52% for hepatitis B, and 25% for hepatitis C. There were 44% who said they did not have enough information about hepatitis B and C. Less than half (43%) received hepatitis B vaccine; however, 51% of unvaccinated youths indicated that they would receive vaccination if offered. These Midwestern homeless youths face multiple health risks, including those related to substance use and exposure to unsterile needles. Despite unsafe behaviors, many of these youths were interested in methods to protect their health, including education, knowing their HIV or viral hepatitis serostatus, and obtaining hepatitis B immunization.*

**KEYWORDS** *Adolescence, Hepatitis B virus, Hepatitis C virus, Human immunodeficiency virus, Substance use.*

## INTRODUCTION

Homeless and runaway youths represent a large and highly vulnerable population on the streets of towns and cities throughout the US. One representative national survey during 1992–1993 found that 7.6% of youths 12–17 years of age had spent at least one night in the previous year in a shelter, public place, abandoned building, outside, underground, or with a stranger.[1] Estimates of the number of runaway and homeless youths in the US have varied greatly, in part related to the difficulty in characterizing this diverse population, with figures ranging between 500,000 and 2 million.[2]

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Youths living on the street have a variety of health care needs, including those related to substance abuse.[3] One multisite study of youths aged 12–21 years found that street youths were more likely to use tobacco, alcohol, marijuana, cocaine, and many other drugs.[4] Of particular concern, 3.6% of runaway and homeless youths living in shelters and 17.1% of those living on the streets reported a history of injection drug use.[4] Among street youths in Los Angeles, 30% reported ever having injected drugs; among these youths, 59% reported sharing needles.[5]

In addition to the many direct and indirect adverse health consequences associated with substance abuse, injection drug use carries the additional risk of bloodborne infections, including human immunodeficiency virus (HIV), hepatitis B, and hepatitis C. Exposures to contaminated blood with unsterile needles used for practices such as tattooing or body piercing may also lead to acquisition of these infections.[6–10]

In Minnesota, it is estimated that, on any given night, approximately 730 unaccompanied youths 17 years of age or younger are without permanent shelter, and that over the course of 1 year, approximately 10,000 Minnesota youths experience at least one episode of homelessness.[11] During 1998 and 1999, we conducted a survey of 201 homeless youths in Minneapolis to learn more about high-risk behaviors and preventive measures. This analysis focuses on substance abuse, including tobacco, alcohol, and injection drugs. We also asked about exposure to unsterile needles through tattooing, body piercing, and needle sharing during drug use. We next evaluated what proportion of youths had been screened for HIV, hepatitis B, and hepatitis C. Finally, questions about hepatitis B immunization included whether these high-risk youths had received the vaccine, whether unvaccinated street youths would be willing to receive the vaccine if offered, and the most important reasons for their positive or negative decision.

## METHODS

A convenience sample of homeless youths was recruited from multiple settings in Minneapolis, Minnesota, where a high proportion of street youths were known to congregate; these included coffee houses and drop-in centers that specifically cater to homeless youths. Recruitment was conducted by experienced street youth outreach workers, who approached youths known or suspected to be homeless and asked if they would be willing to be interviewed. Eligibility criteria included lacking shelter for at least 2 weeks in the past year and being 15 to 22 years of age. Participants received $20 in food or clothing vouchers or bus passes as reimbursement for their time and participation. Informed consent was obtained from all participants. Almost 90% of participants were interviewed by one of two experienced outreach workers; of all youth initially approached by one of these two outreach workers, only 12% refused to be interviewed.

The interview included questions about demographics (including circumstances of homelessness), sexual behaviors, drug use practices, smoking, alcohol use, and exposure to needles by tattoos and body piercing. Drug questions included specific questions about injection use. Participants were also asked about previous testing for hepatitis B, hepatitis C, and HIV, as well as whether they had received the hepatitis B vaccine. Youths were asked in open-ended questions why they would or would not take the hepatitis B vaccine; responses were transcribed and later coded into categories. At the conclusion of the interview, outreach workers provided participants with risk-reduction information, referrals, and materials, including con-

doms. Statistical testing was conducted using the chi-square test. In the evaluation of differences by race/ethnicity, only Caucasian, African American, and Native American youths were compared; numbers in other groups were too small for meaningful statistical analysis.

## RESULTS

During 1998 and 1999, 201 youths were interviewed, including 121 (60%) males and 80 (40%) females. The median age was 19 years; 23% were 15–17 years old, and 77% were 18–22 years of age. Of the respondents, 47% were Caucasian, 28% African American, 9% Native American, 5% Hispanic, 4% Asian–Pacific Islander, and 8% unknown or mixed race/ethnicity. There were 72% with less than a high school education.

When asked how much time participants spent living on the streets or "couch hopping" in the previous year, 31% reported 1–3 months, 24% reported 4–6 months, 17% reported 7–9 months, and 28% reported 10–12 months; the median time was 6 months. Of 178 youths reporting their current living situation, 42% reported staying with friends, 19% were living in a shelter, 13% were living on the street or in squatter locations such as abandoned buildings, 16% were staying with relatives, and 10% were living in other settings.

Smoking cigarettes was reported by 153 (76%) of youths, including 71 (35%) who typically smoked less than 1 pack per day, 77 (38%) who smoked 1–2 packs per day, and 5 (2%) who smoked more than 2 packs per day. Youths reported smoking cigarettes a median of 5 years. Seventy-five (35%) of all the youths in this study reported smoking marijuana at least three times a week.

Of 186 youths reporting the amount of alcohol (beer, wine, or hard liquor) consumed in a typical week, 62 (33%) reported none, 29 (16%) had 4 or fewer drinks per week, 27 (15%) had 5–14 drinks per week, and 68 (37%) youths had 15 or more drinks per week. Drinking 15 or more drinks per week was reported by 43% of males and 27% of females ($P = .02$), by 30% of youths 15–17 years of age, and 38% of those 18–22 years ($P > .10$), and by 33% of Caucasian, 31% of African American, and 61% of Native American youths ($P = .06$).

A lifetime history of injection drug use was reported by 31 youths (15%), including 13 (6%) youths who reported drug injection in the previous 30 days. Drugs used by injection at least once in a respondent's lifetime included heroin (17 youths), amphetamines (15), cocaine (12), and speedball (heroin and cocaine) (8). Nine youths who had taken injection drugs in the past 30 days reported sharing needles with one or more partners. Lifetime injection drug use was reported by 21% of females and 12% of males ($P = .06$), by 17% of youths 15–17 years of age and 15% of those 18–22 years old ($P > .10$), and by 22% of Caucasian, 7% of African American, and 17% of Native American youths ($P = .07$).

A tattoo was received by 109 (54%) youths, including 40 (20%) who reported that at least one tattoo had been done with a needle that had not been sterilized or had been used by someone else. There were 127 (63%) youths reporting one or more body piercings, including 37 (18%) reporting that at least one body piercing had been done with a needle that had not been sterilized or had been used by someone else.

There were 137 (68%) youths who reported ever being tested for HIV, 105 (52%) for hepatitis B, and 51 (25%) for hepatitis C. Three youths reported receiving a positive HIV test, and one a positive hepatitis C test. Six youths reported

receiving a positive hepatitis B test, although it was uncertain if this represented previous or current infection. Of those youths that received one or more tattoos with unsterile needles, 63% had been tested for HIV, 53% for hepatitis B, and 30% for hepatitis C. Of those youths who received one or more body piercings with unsterile needles, 59% had been tested for HIV, 62% for hepatitis B, and 32% for hepatitis C. Among those reporting a lifetime history of injection drug use, 81% had been tested for HIV, 81% for hepatitis B, and only 35% for hepatitis C. Although only 19 (9%) of youths said they did not have enough information about HIV, 88 (44%) of youths said they did not have enough information about hepatitis B and hepatitis C, including how they are transmitted.

Of the youths, 87 (43%) reported receiving the hepatitis B vaccine. Vaccination was reported by 49% of females and 40% of males ($P > .10$), by 40% of those 15–17 years of age, and 44% of those 18–22 years old ($P > .10$), and by 51% of Caucasian, 43% of African American, and 17% of Native American youths ($P = .03$). Receipt of vaccine was reported by 55% of youths with a lifetime history of injection drug use, 49% of those receiving body piercing with unsterile needles, and 38% of those tattooed with unsterile needles. Only 3 (23%) of the 13 youths who reported injection drug use in the last 30 days had received vaccine.

Of 114 youths who had not been vaccinated, 58 (51%) said they would receive the vaccine if it were offered. Among 51 unvaccinated youths who gave specific reasons why they would take the vaccine if offered, the most common reason, given by 88% of respondents, was to stay healthy or avoid disease, followed by preventing death (6%). Typical specific answers included "just to be safe," "to prevent it [hepatitis]," and "I don't want to get sick." Among 27 unvaccinated youths who gave specific reasons why they would not take the vaccine, the most common reasons were fear of needles (41%), feeling that they did not need it (22%), not having enough information (15%), and distrust of doctors or the vaccine (15%). Typical specific answers included "I don't like needles," "I don't trust doctors," and "I'm not at risk."

## DISCUSSION

Our study found that a large proportion of homeless youths were heavy users or abusers of a variety of substances, including tobacco, alcohol, and marijuana. A number of youths were at increased risk for blood-borne infections, such as HIV, hepatitis B, or hepatitis C, because of a history of injection drug use or exposure to unsterile needles through tattooing or body piercing. Despite this history, many of these high-risk adolescents had not been tested for these viral infections or received the hepatitis B vaccine.

It is not surprising that many of the youths in this study reported heavy use of tobacco, alcohol, and marijuana. Other surveys of street youths have also reported a high proportion of youths using these and other drugs.[4] However, even among nonhomeless adolescents, tobacco, alcohol, and marijuana use are common,[12] highlighting the magnitude of this problem for adolescent health in general. In addition to the substantial health risks associated with alcohol use itself, a number of studies have found that youths who drink alcohol or who use marijuana and other drugs are more likely to engage in unsafe sexual behaviors,[13–17] increasing their risk for HIV and other sexually transmitted infections.

The rates of substance abuse in this population indicate the need for more drug intervention and treatment services for homeless youths. Use of alcohol, marijuana,

and other drugs by adolescents may also be associated with mental health needs, including previous physical or sexual abuse.[18] Drug treatment and other programs to meet the health needs of such youth should ideally have a number of qualities, including being adolescent-centered, community-based, comprehensive (recognizing mental health and other needs), collaborative with other youth programs, empowering, accessible, and culturally sensitive.[2] HIV risk-reduction programs targeting runaway and homeless youths have utilized strategies such as street outreach, provision of information, training in coping skills, and access to health care and other resources.[19,20] Such strategies would be relevant to other prevention programs, including drug treatment.

There were 15% of the youths who reported a history of injection drug use, including 6% who injected in the previous 30 days. Reports of the proportion of homeless or street youths who have used injection drugs have varied considerably,[4,5,16] in part reflecting the diverse nature of this population. Although the numbers were small, 69% of those in this study who had injected in the past 30 days had shared needles with one or more partners. Risk reduction strategies for injection drug users have included drug treatment and, for those who continue injection drug use, syringe-exchange and other programs to provide clean needles and equipment.[21] It is important that such programs are accessible to homeless youths who use injection drugs.

Many homeless youths are at risk for HIV infection or hepatitis B through either sexual or drug-using practices[22–26]; hepatitis C may also be acquired, particularly through injection drug use.[27] In studies of drug users injecting for 1 year or less, serologic evidence of hepatitis B was already found in 50% and hepatitis C in 65% of the individuals.[28] Studies have indicated that tattooing, body piercing, and other exposures to contaminated needles also are associated with hepatitis B or C transmission.[6–10] In addition, hepatitis C infection has been suggested after use of intranasal cocaine, possibly through sharing blood-contaminated straws.[7]

Although many youths in this study reported being tested for HIV or hepatitis B at least once, 32% had never been tested for HIV, and 48% were never tested for hepatitis B. There were 75% who had never been tested for hepatitis C, including 65% of those reporting a history of injection drug use. There are a number of advantages to counseling and testing for these infections. For those found to be HIV or hepatitis C positive, medical evaluation and treatment can help change the course of these potentially life-threatening infections.[29,30] For those currently infected with hepatitis B, additional recommendations include vaccination of close contacts (including sex partners and household contacts).[31] For pregnant women, there are specific guidelines to help prevent perinatal hepatitis B and HIV transmission.[31,32] Those infected with HIV, hepatitis B, or hepatitis C can also take other appropriate and recommended measures to reduce transmission of these agents. For example, knowledge of a positive HIV status may lead to a reduction in unsafe sexual or drug using behaviors.[33,34]

A number of measures can be taken to improve screening rates even further for HIV and other infections of importance. Street outreach, as well as testing at free clinics, adolescent clinics, youth service agencies, and other community-based settings, offer alternatives to screening in more traditional locations.[23,34] Because street youths and other at-risk persons may not return for their test results, use of rapid HIV tests enables health care providers to supply negative and preliminary positive results within approximately 10 minutes.[35] Recent developments in HIV testing technology now allow for rapid testing to be done on oral fluids.[36] Provision of

HIV, hepatitis B, and hepatitis C screening requires skilled age-appropriate and culturally sensitive counseling that is relevant to the specific circumstances of homeless youths. Since such youths may have limited access to health services, it is also critical that any screening program include mechanisms of referral to social and medical services for those who test positive.

To help prevent hepatitis B infection, homeless youths should be a priority for hepatitis B immunization. In addition to recommendations for universal vaccination of infants and adolescents 11–12 years of age, vaccination is recommended for unvaccinated adolescents older than 12 years of age who are at increased risk for hepatitis B; these include those with more than one sexual partner in a 6-month period, men who have sex with men, and those using injecting drugs.[26]

Consistent with recommendations for universal immunization, Minnesota School Law requires hepatitis B vaccination for kindergartners and seventh grade children.[37] Although hepatitis B immunization rates are above 90% for Minnesota infants,[38] rates among adolescents and young adults (especially those at increased risk) have not been well studied, and there is a need for more data in this area. In our study, receipt of hepatitis B vaccine was reported by only 43% of youths, including 55% of youths with a history of injection drug use.

Although immunization rates in our study population were suboptimal, we found that many unvaccinated youths are potentially interested in receiving the vaccine. Of respondents who had not been vaccinated, 51% said they would receive the hepatitis B vaccine if it were offered. Consistent with studies of hepatitis B vaccination of adolescents in other settings, the desire to be protected from hepatitis B was an important motivator.[39] If certain beliefs (such as feeling the vaccine is unnecessary) or negative attitudes (such as distrust of doctors) can be addressed, acceptance may be improved. Because homeless youths may be outside traditional clinical or school settings in which hepatitis B vaccine is often offered, innovative strategies are needed that increase access to immunizations in convenient settings.[39,40] Examples of other health locations at which immunizations may be given include sexually transmitted disease, public health, and family planning clinics, as well as substance abuse treatment programs.[39,41] Vaccinations may also be offered using community outreach workers or mobile units or at nontraditional sites such as syringe-exchange programs, parks, and other locations where at-risk individuals are likely to congregate.[41,42]

This analysis reported rates for certain specific practices (heavy alcohol use, injection drug use, and lack of hepatitis B immunization) by certain demographic subgroups (stratified by gender, race/ethnicity, and age). Although results of statistical testing are presented, these subgroup comparisons should be viewed as exploratory and hypothesis generating. This study was designed to describe a wide range of behaviors in a high-risk population rather than as a test of a specific a priori hypothesis. Although there were modest differences among certain subgroups, the larger message from this study is that all demographic groups were to some extent at risk.

Our study is subject to several limitations. Participants in this study were recruited from multiple community-based settings where street youths were known to congregate. Although we had a high participation rate among those youths approached to be in this study, these youths are not necessarily representative of all homeless youths in Minneapolis. Methodologic difficulties in sampling this population include identifying those "hidden" individuals who do not present to programs or public settings known to be frequented by homeless youths, as well as different

definitions of "homelessness," including runaways, those living long term on the street, and children in shelters or other institutional settings.[1–3,43] In this study, over two thirds (69%) of those sampled reported being homeless for at least 4 months during the previous year. Therefore, even if not representative of all homeless youths, they represent a significant and highly vulnerable subgroup of importance.

Second, the findings of this study are based on self-report. Although drug use and other histories could not be independently verified, a number of measures were taken to make subjects feel more comfortable in giving accurate responses. These included use of experienced outreach workers, conducting interviews in familiar community settings, allowing interviewers to ask additional clarification questions if certain responses were unclear, and not collecting names or other personal identifiers during the interview process.

Third, although this report focused on unsafe behaviors related to substance abuse and exposure to unsterile needles, homeless youths have a variety of other health risks. In a report separate from this study, we describe high-risk sexual behaviors of these youths, which also can lead to infection with HIV and hepatitis B, as well as other sexually transmitted diseases. Homeless youths have many other physical and mental health needs and concerns, including those related to inadequate nutrition, harsh outdoor climates, and physical violence.[2,3,44]

Throughout the world, homeless youths are exposed on a daily basis to conditions that may lead to serious illness, long-lasting disability, and even death. Our study has identified a number of health threats these adolescents face related to substance abuse and needle-related behaviors. At the same time, our study reinforces that many homeless youths can be accessed by experienced outreach workers, are responsive to talking about health problems, and are interested in methods to protect their health, including education, knowing their HIV or viral hepatitis serostatus, and hepatitis B immunization. To turn away from the needs of this highly vulnerable population is to turn our backs on those youths that need our help most.

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